

FROM FARM TO FORK: DETERMINANTS OF SUPPLIER-RETAILER RELATION IN ORGANIC AGRI-FOOD SUPPLY CHAIN ON EU EASTERN – WESTERN APPROACH

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Abstract. The European Union's Farm to Fork Strategy, embedded within the Green Deal, aims to create equitable and sustainable food systems, fostering environmentally responsible practices and addressing challenges comprehensively throughout the agri-food supply chain. Organic farming plays an important role in this transition, particularly in the context of the circular economy. This study explores the key determinants influencing supplier-retailer relationships in the organic agri-food supply chain, focusing on the interaction between Romanian suppliers and retailers from Germany, Austria, and Switzerland. Using a mixed-methods approach that combines quantitative and qualitative analysis, the research identifies price, quality, and trust as essential factors shaping demand. Given Romania's growing organic agriculture sector and the increasing consumption of organic products in German-speaking markets, this study highlights both challenges and opportunities for enhancing trade relations. As one of the first investigations into the East-West dynamics of the EU organic agri-food supply chain, the findings provide valuable insights for strengthening sustainable agriculture and market integration in Romania. It is also relevant for other Eastern European countries emphasizing the importance of a strong green agri-food sector throughout the European Union, as well as coordinated efforts along the supply chain.

Keywords: farm to fork, green deal, organic agri-food, organic farming, supply chain, agriculture, circular economy in agri-food.

JEL Classification: Q11, Q15, Q56.

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1. Introduction

Sustainable development has become essential for agriculture, the agriculture industry and the entire agri-food sector (Mangla et al., 2018). Organic farming acts as a middle ground between our food demands on nature and what nature can sustainably provide, as it has a lesser environmental footprint compared to conventional farming methods (Petrescu et al., 2017). Organic farming is a system of management and agricultural production that merges

environmentally sustainable practices with high biodiversity, safeguards for natural resources, and production techniques aligned with consumer expectations for food made using natural substances and processes (Pawlewicz, 2019; Nagy, 2007). The complete food supply chain, from farm to fork, is sensitive to environmental factors and is under pressure to cope with these challenging realities, such as changes in climate and the decline of biodiversity, as well as resource scarcity and food loss and waste generation; in these conditions, there is an imperative paradigm shift towards a circular economy too (Esposito et al., 2020). Green investments are necessary in the agri-food system so that changing the way food is obtained could serve as a strong catalyst for sustainable development (Ene et al., 2019; Nagy, 2016).

In this context, the research aims to highlight the determinants of the supplier-retailer relation in the green agri-food supply chain, relevant given the objectives of the European Union Green Deal (EUGD) and the Farm to Fork Strategy (FFS). The research is based on an online questionnaire conducted on organic agri-food retailers in Germany, Austria and Switzerland on the demand factors and the specificities of the relation with suppliers from Romania.

Thus, this study aims to explore the key determinants of supplier-retailer relations in the organic agri-food sector, focusing on the perspectives of retailers from Germany, Austria, and Switzerland in their interactions with Romanian suppliers. This study addresses the following core research questions:

- What factors drive trust and collaboration between these actors?
- How do perceptions of price, quality, and origin influence purchasing decisions?
- How can Romania better integrate into Western organic food supply chains?

The relevance of the research is also supported by the following premises:

- Germany, Switzerland, and Austria are among the European countries with the best indicators in terms of demand and consumption of organic products: Germany is the largest market for organic products in Europe (15870 million Euros in 2021) and the second in the world, (FiBL & IFOAM, 2023, pp. 254–255); Switzerland 4th/46th place and 8% of the total in Europe); Austria (8/46th in Europe) in 2021;
- Romania has great potential for organic farming and records increasing figures for the main indicators;
- one of the purposes of the EU-FFS refers to the fact that the processes involved in the production, transportation, distribution, marketing, and consumption of food have either a neutral or beneficial effect on the environment (FiBL & IFOAM, 2021, p. 222) and to reach the target of 25% organic farmland in Europe by 2030, suitable and timely support measures are required, (FiBL & IFOAM, 2023, p. 226);
- there is a high interest for the topic of sustainable agri-food systems and supply chain, with an exponential increase of dedicated research; however, most studies focus on developed, industrialized countries (e.g. Western European countries) (El Bilali et al., 2021), while there are very few approaching Eastern European nations or the relations east-west within the EU.

However, while the organic food market continues to grow, most empirical studies remain focused on Western EU member states or internal supply chain mechanisms. There is a lack of research addressing cross-regional supplier-retailer dynamics between Eastern and Western Europe, especially regarding trust, pricing, and quality perceptions. This gap is particularly evident in relation to Romania's potential as a major organic supplier.

This study contributes to the literature by addressing this significant research gap concerning East-West integration within the EU organic supply chain. It provides new empirical

insights into the underexplored Romanian context, offering evidence that can support both academic inquiry and informed policymaking. From a practical standpoint, the findings can assist agri-food stakeholders in optimizing cross-border collaboration, tailoring sustainability strategies, and improving supply chain resilience.

The paper is structured in three main parts: the first outlines the research context and literature review, including the EUGD, the FFS, green agri-food products, and their impact on the supply chain, as well as an analysis of organic agriculture in the EU and Romania. The second part presents the research methodology, and the third part covers the results and their discussion. The paper concludes with final remarks and future directions.

2. Research background and literature review

2.1. European Union green deal and farm to fork strategy

In December 2019, the EU presented its EUGD as a new growth strategy targeting EU transformation into a fair and prosperous society, with a resource-efficient and competitive economy that achieves zero net greenhouse gas emissions by 2050, with an economic model independent from intensive resource utilization. The EU aims to become global leader in green innovation targeting policy areas referring to: biodiversity preservation, eco-friendly food systems, sustainable agriculture practices, renewable energy sources, eco-conscious industry practices, pollution free and controlling climate actions (European Commission [EC], 2019). As formulated, the EUGD becomes the most ambitious package of measures supporting citizens and businesses to benefit from sustainable green transition. The proposed actions, following policies roadmap refer to reducing emissions, dedicating resources to advanced research and innovation, and safeguarding Europe's natural surroundings (Montanarella & Panagos, 2021).

By prioritizing its ecological issue, the EU adopts an innovative route to a new world in harmony with the biosphere. The goals of the EUGD are not only determined by ecosystem services but also by socioeconomic and political factors (Ossewaarde & Ossewaarde-Lowtoo, 2020) and defined this way, it aims to transform the systems and institutions, including power structures and economic setups, through a comprehensive strategy (Sandberg et al., 2019). The new strategic orientations indicate a radical green shift. Especially post-pandemic, the EUGD seems to represent a detailed programmatic vision for the entire economy, with a significant emphasis on the primary sector and the agricultural and food sector (Gargano et al., 2021).

The agroecological approach becomes a cornerstone in most EU strategies and plans (EUGD, Strategy for Biodiversity, Action for Climate, FFS) considering that ecological transition must be addressed without delay. Ecology must be enhanced as natural capital, defined as a form of natural capital, referring to the natural resources that sustain life (EC, 2020a). Specifically, the components of the EUGD focused on preventing biodiversity decline, lowering pollution levels, and enhancing food quality are The FFS and Biodiversity Strategy (Panka et al., 2021), besides the Common Agricultural Policy (EC, 2020c, 2022). The FFS lies at the core of the EUGD, with the goal of creating fair, healthy, and eco-friendly food systems. It emphasizes a new and improved equilibrium among nature, food systems, and biodiversity to safeguard the health and well-being of citizens, while simultaneously boosting the EU's competitiveness and resilience (EC, 2020b). For the first time at EU level, food sustainability is tackled holistically, encompassing everything from primary production to consumption, to ensure that the pillars of food and nutritional

security for present and upcoming generations are not compromised (El Chami, 2020). The main challenges of the food system are addressed within The FFS, e.g. nutrient over-supply, pesticide use, decreasing farm diversity or climate change mitigation (Moschitz et al., 2021), emphasizing unified approaches for fisheries and farming, sustainable food consumption, and food habits (Hereu-Morales et al., 2023).

By designing a food policy which traces food from source to consumption, the FFS establishes numerous objectives aimed at benefiting both consumers and the environment: minimizing the environmental impact of food production to align with future climate targets, cutting down on food loss and waste, improving food security, reducing food fraud in the supply chain, and promoting the shift to healthy, local and more sustainable foods.

To make the FFS more concrete, the EU has put forward some targets: transitioning 25% of all member state farms to organic by 2030, reducing by 50% total EU sales of antibiotics for farmed animals and aquaculture, reducing chemical pesticide usage by 50%, lowering soil nutrient losses by 50% without compromising soil fertility, and decreasing chemical fertilizer usage by 20% (EC, 2020b), all connected to the circular economy principles.

The circular economy concept has become more and more of interest for scholars and practitioners and there is a vast literature approaching this topic from different perspectives as highlighted by different research (Kirchherr et al., 2017; Popa et al., 2023) which emphasizes the importance of connecting and supporting initiatives to provide integrated framework. Creating public policies, providing incentives, and enforcing environmental regulations are challenges which must be addressed (Kumar et al., 2023). Enhancing natural resource management, reducing chemical usage in soil, and embracing waste valorization to create high-value goods through circular economy tactics are essential (Araujo et al., 2023).

However, the transformation to sustainable agriculture and green agri-food systems, as stated by several strategies and policy papers requires a holistic approach considering social, economic, cultural, technical, and environmental aspects, involving local adaptations of agricultural structures and stakeholder participation (Boix-Fayos & de Vente, 2023). Driving positive transformations and coordinating efforts for sustainability within the agri-food system is a multifaceted task, particularly due to the various stakeholders and interests at play. Moreover, the challenge is deepened by the widespread geographic reach of this sector and its intricate value chains, which encompass diverse stakeholders of varying sizes with distinct resources, capabilities, and incentives (Testa et al., 2022).

2.2. Agri-food greening. Impact on supply chain

Food holds a notable share of current production and consumption, with substantial impact on economic growth, job creation, health, communities, and the environment. The agri-food sector ranks as one of the most prominent manufacturing industries due to its vibrant innovative ecosystem (Saguy et al., 2018; Rowan, 2019). Chain actors can thus contribute to finding a balance between competition and collaboration, so all chain actors can reach a higher level of competitiveness (Čechura et al., 2024).

Sustainability has urged the adaptation and adoption of sustainable behaviors which are encountered in the form of green consumers, sustainable farmers, and agriculturists, etc. (Panait & Raimi, 2021). A food value chain involves multiple product flows, financial flows and decision-making among value chain actors (McGarraghy et al., 2022).

Consumer demand for high-quality food and increased environmental awareness have resulted in a growing inclination towards sustainable agricultural products (Pietrzyk et al.,

2021). Organic is discovered as the most sought-after “green” characteristic of food, potentially appealing to consumers seeking environmentally friendly and health-conscious choices (Yang & Le, 2023).

Nowadays consumers are increasingly recognizing the harmful impact of conventional agriculture on the environment. It is fair to suggest that individuals who choose organic food are more likely to prioritize environmental concerns, given their heightened awareness of the ecological effects of their dietary decisions (Percsi et al., 2024).

Also, they are deeply concerned about the health consequences of heavily processed foods. As a result, consumers who prioritize environmental and health considerations are more inclined to purchase eco-friendly, organic food (Krystallis & Chrysosoidis, 2005). Forecasts predict a continued expansion of organic, natural, and nutritious food in local markets (Statista, 2020), therefore there is an urgent requirement to broaden food supply chains and identify sustainable technologies within food systems that can cater to evolving dietary patterns, an aging population, diverse ethnic and cultural groups, diet-related illnesses, and a demand for more personalized products (Galanakis, 2020). Another issue is food safety, which can be accomplished by implementing sustainable agricultural practices within local communities (Dragoi et al., 2018).

Considering this, food should be both safe and nutritious, maintaining high quality, while ensuring that production methods are environmentally friendly and climate neutral. Incorporating these factors implies adjustments throughout all stages of the supply chain (Prandecki et al., 2021). The increasing awareness regarding environmental conservation and its lasting impacts on business and marketing affects the whole supply chain of green agri-food. Organizations integrate in their marketing strategies more elements of social media networks with different objectives: from targeting new customers to promoting the core values of their culture to a wide range of stakeholders (Orzan et al., 2021). The environmental consciousness of consumers extends to their suppliers and even further down the chain, creating a multiplying effect with circular implications: sustainable practices in production and consumption foster the adoption of eco-friendly technologies, diminishing waste, greenhouse gas emissions, and pollution, leading to a cleaner environment and promoting sustainable behavioral patterns (Dinu, 2020).

The green agenda in food supply chains should be an ongoing journey in which the collaboration between producers, supplier, retailer, and consumer is vital in conveying the significance and consequences of sustainability (Moreira-Dantas et al., 2023).

Nowadays, food supply chains are becoming increasingly globalized, with environmental and social impacts evident at every stage: starting from agricultural production, passing through food manufacturing, wholesale operations handling imported goods, all the way to retail and catering services (Yakovleva et al., 2012). Choosing green suppliers plays a crucial role in determining the competitiveness of the overall supply chain network (Konys, 2019). Increased environmental and ethical concerns regarding food supply chain effects on the natural environment have prompted various stakeholders to intensify pressure for enhancing the sustainability standards of product lifecycles, spanning from farm to table fork (Courville, 2003; Weatherell et al., 2003; Ilbery & Maye, 2005).

Along each step of the supply chain, partnerships focused on the environment have a beneficial impact on every aspect of environmental performance, with customer and regulatory influences playing a role in shaping this association (Barbosa & Cansino, 2024).

This transformation is a collective responsibility for society as a whole and can only be achieved through a shift in attitudes on a widespread scale. However, these efforts need

enhancement, with all parties involved in logistics, storage, processing, and trade which need to be educated about the specific demands and regulations of organic food production (Moschitz et al., 2021).

2.3. Agriculture and organic farming in the European Union and Romania

Agriculture and organic farming in the EU exhibit substantial variations in terms of agrarian setup, production levels, and the interplay between production factors and their efficiency, while a clear difference is seen between older member states and the more recent ones (Nowak & Rozanska-Boczula, 2022).

Since the 1980s, the EU has implemented voluntary agri-environmental measures that have evolved into a crucial policy tool for preserving the agricultural environment (Uthes & Matzdorf, 2013). Then, after 2005, organic farming measures became mandatory in all Member States (EC, 2005). Numerous countries initiated organic farming practices and subsequently fostered the advancement of sustainable agriculture.

Organic farming offers one of the greatest opportunities for development. In 2020, the agricultural sector in the EU generated a gross added value of EUR 177 billion (1.3% in EU GDP), which represents an increase of 27.2% compared to 2010, but a decrease of 1.5% compared to 2019 (Eurostat, 2021, p. 68). The area allocated to organic crops represented 8.5% of the total agricultural area in 2019 (Eurostat, 2021) respectively 13.8 million ha, Austria with the highest percentage (25.3%) and Romania, at the opposite end, with only 2.9%. However, Romania is among the top countries for organic cereal crops with a percentage of 10.2% (Eurostat, 2021) and with one of the largest European wild flora areas, 25.3% of the total in 2019 (FiBL & IFOAM, 2021, p. 228) and an increasing in organic farmland in 2021/2020 with 0.11 million ha (FiBL & IFOAM, 2023, p. 224, p. 238). In 2021 (compared to 2020), the European organic agriculture (FiBL & IFOAM, 2023, p. 224) recorded an increase of 4.4% in number of organic farmland and of 5.4% in number of organic producers and 8.2% for EU (FiBL & IFOAM, 2023, p. 236) while the highest number is recorded in Italy. The European organic products market in 2021/2020 (FiBL & IFOAM, 2023, p. 224) recorded an increase of 3.8 % with 54.5 billion euros sales; Germany is the country with the largest amount spent (15.9 billion euros) and Estonia with the highest growth in the organic market (21.0%). Among the largest importers in 2021 are found Germany (2016), France and Italy of total EU importers (FiBL & IFOAM, 2023, p. 234). In 2021, the organic products market share was the highest in Denmark (13.0%) followed by Austria (11.0%), Luxembourg (11.0%) and with Switzerland (424 euros) as the first place as per capita consumption (FiBL & IFOAM, 2023, p. 234). Figure 1 presents the comparative growth of organic farmland and retail sales in EU for the period 2000–2021 (FiBL & IFOAM, 2023, p. 225), while a direct association, with a positive trend for both indicators can be observed; however, the organic market has exponential growth compared to the cultivated area. According to this source, the organic market increased in 2021/2020 by more than 54.5 billion euros, i.e. by over 3.8% while the growth rate of organic farmland increased by 3.6%. The Research of Organic Agriculture FiBL and IFOAM notes in the latest report the need to increase the organic cultivated area up to the target of 25% as set by the EU in the FFS by 2030 (FiBL & IFOAM, 2021, p. 220; FiBL & IFOAM, 2023, p. 226). The Figure 2 offer also a comparative situation Europe – EU for the number of organic producers for 2000–2021 according to FiBL & IFOAM (2023, p. 250).

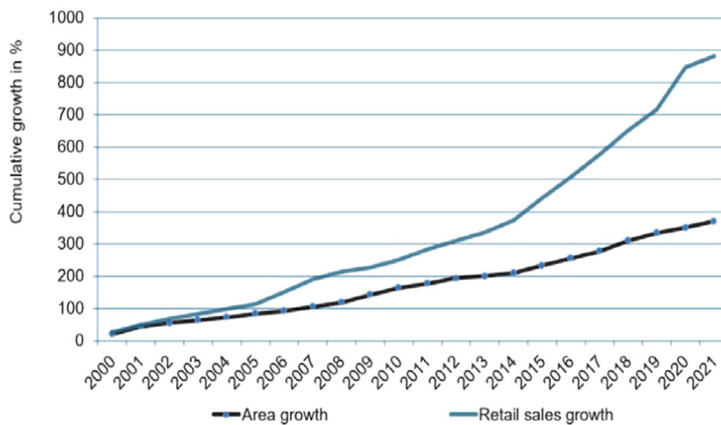


Figure 1. EU: Growth of organic farmland and retail sales 2000–2021 compared (source: FiBL & IFOAM, 2023, p. 225)

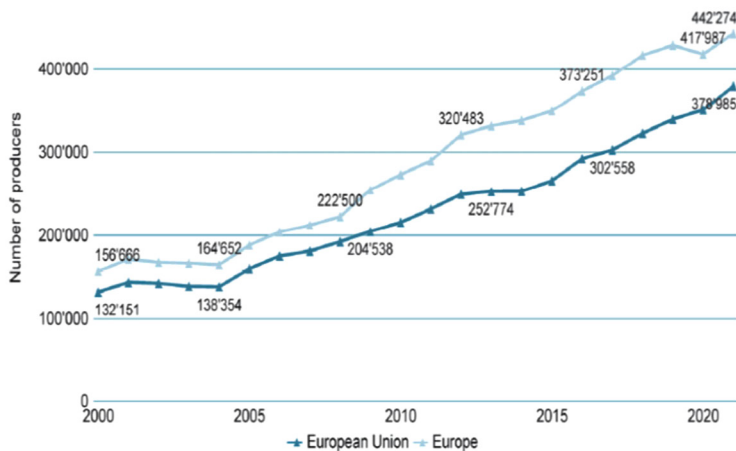


Figure 2. Europe and the EU: Development of the number of organic producers 2000–2021 (source: FiBL & IFOAM, 2023, p. 250)

If we look at the structure of the marketing channels for organic products in Europe (Figure 3) we offer another starting point for the present research, the countries selected in the research have a developed marketing channel as follows: Austria has 86% of general retailers, and 14% of specialized of other channels, Switzerland 6% of direct marketing, 81% general retailers and 9% of specialized retailers (FiBL & IFOAM, 2021, p. 261).

Europe percentage, Romania recorded the position 14/46 with 395228 ha in 2019 (FiBL & IFOAM, 2021, pp. 232–234) and increased to 8/46 in 2021 in organic agricultural land (FiBL & IFOAM, 2023, p. 240), one of the largest conversion zones, 578718 ha but in terms of organic share of total agricultural land in 2021 Romania (4.3%) is up to the Europe percentage (3.58%) but under the EU percentage of 9.63% (FiBL & IFOAM, 2023, p. 241). However, Romania occupies very good positions in Europe with one of 3/10 highest growth in organic agricultural

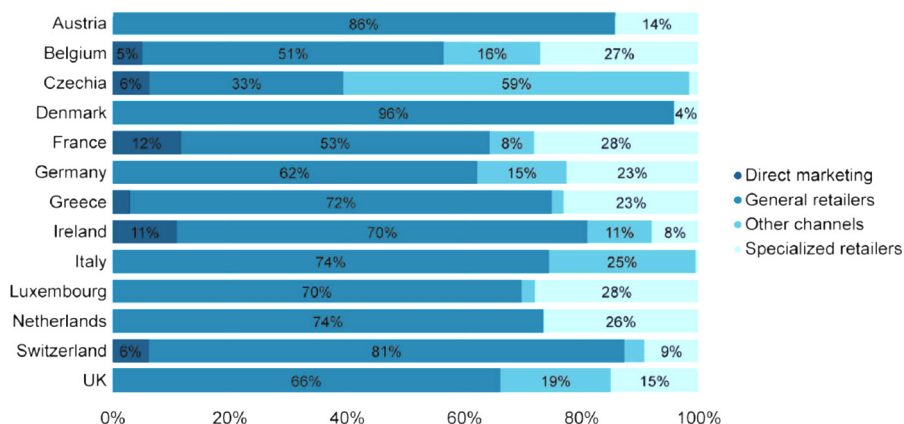


Figure 3. Europe – marketing channels for organic products in selected countries 2021 (source: FiBL & IFOAM, 2021, p. 261)

land in hectares in 2021 (109.8 K). Romania also is present in top ten permanent grassland (9/10), arable crops (8/10) and permanent crops (10/10) and with a good number (11562) in the total European organic producers, occupying the 10/46th place (FiBL & IFOAM, 2023, p. 256). Considering the indicators of organic agriculture, for the period 2006–2022 Romania registered positive developments for most important of them (Figure 4a–d):

- Total number of certified organic farmers (Figure 4a);
- Total area of organic farming, ha (Figure 4b);
- Permanent crops, ha (orchards, vines, fruit trees, etc.) (Figure 4c);
- Permanent crops, ha (meadows) (Figure 4c);
- Fallow land, ha (Figure 4d).

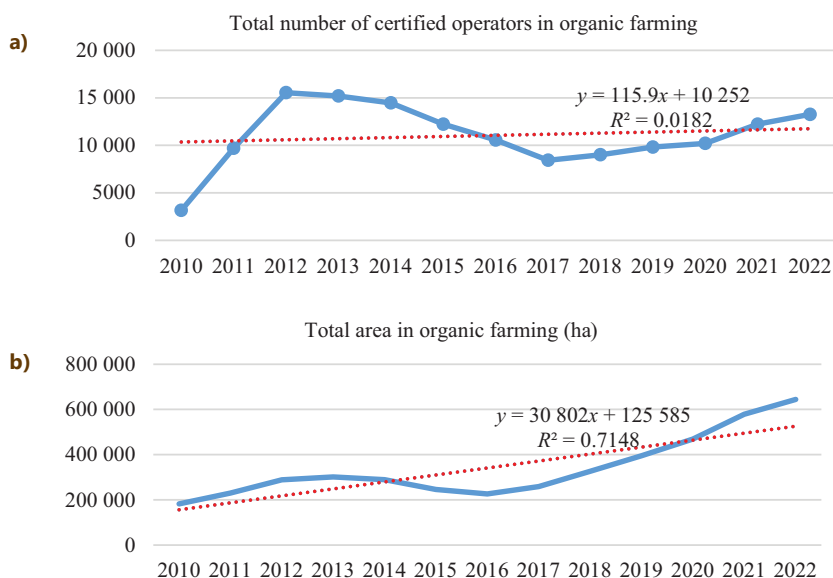


Figure 4. To be continued

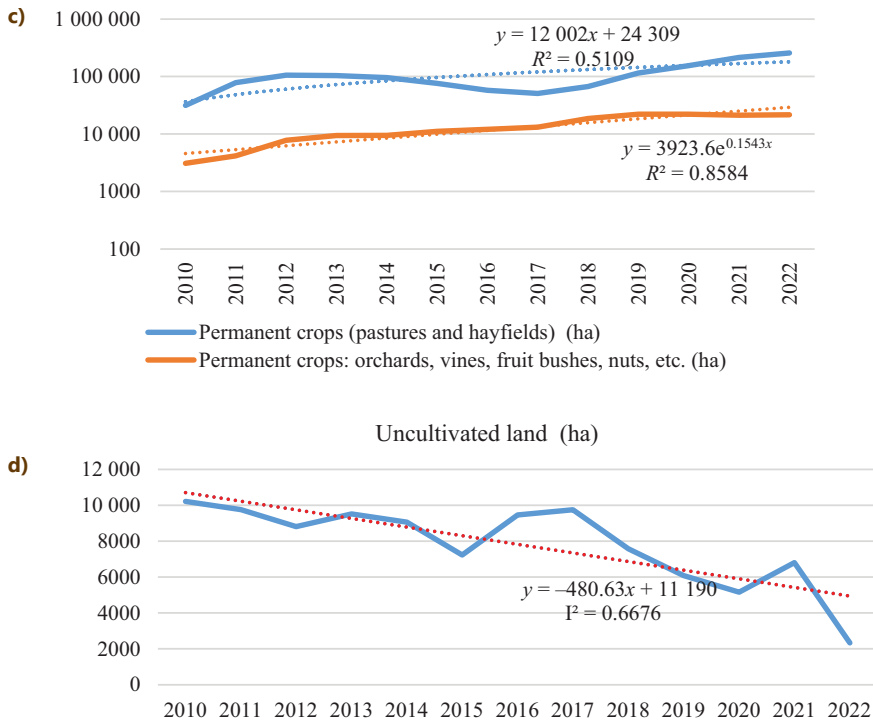


Figure 4. Dynamics of organic agriculture indicators in Romania 2006–2020: a – Total number of certified organic farmers; b – Total area of organic farming; c – Permanent crops, ha (orchards, vines, fruit trees, etc.), Permanent crops, ha (meadows); d – Fallow land, ha (source: made by the authors based on Ministerul Agriculturii și Dezvoltării Rurale [MADR] 2021, 2023, 2024)

From Figure 4a–d it is noted that Romania has a great potential for organic agriculture and registers increasing figures for the main indicators in the period 2006–2022, respectively for the indicator of uncultivated land in the period 2010–2022.

In time, the Romanian agricultural sector improved its competitiveness, and an efficient and competitive agricultural and food sector plays a significant role in maximizing the value of a country's agricultural resources during the transition to a sustainable agricultural economy.

3. Materials and methods

The research aims to highlight the determinants of supplier-retailer relations in the organic agri-food supply chain. The research is based on the analysis of primary data collected with a self-administered online questionnaire applied to retailer companies of organic agri-food organic products based in Germany, Austria, and Switzerland in relation with Romanian suppliers. The research was conducted between December 2022 and June 2023.

The present research had as general/study population the retailer companies of organic food in Austria, Germany, and Switzerland and 1750 companies were identified. The first stage of the research consisted in contacting the embassies and The National Trade Register Offices from the three countries to collect information on the legislation referring to the

exchanges between states and to find out the contact addresses of the companies based in these countries selling organic food. Thus, using as survey method the convenience sampling (Gabor, 2007), the response rate was 3.43%, therefore the research sample consisted of 60 firms as follows:

- country structure: 52 from Germany (86.67%), 5 from Switzerland (8.33%) and 3 from Austria (5%);
- structure according to size: 2 individual, with 1 employee (3.3%), 25 small micro-with 10 employees (41.7%), 16 small with less than 50 employees (26.7%), 12 medium-sized with less than 250 employees (20%) and 5 large with over 250 employees (8.3%).

Due to the complexity of the research, it had several stages and activities according to Table 1, carried out over 6 months, between December 1, 2022, and May 31, 2023.

Table 1. Research calendar and activities (source: made by the authors)

Activities	Period
Elaboration of the research plan, including the drafting of the questionnaire	1–20 December 2022
Contacting embassies abroad to find out the contact addresses of companies sell organic food in Germany, Austria and Switzerland	5–15 January 2023
Contacting foreign companies and inviting them to participate in the study	15 January –15 February 2023
Data collection through the self-administered questionnaire through the platform http://www.isondaje.ro	15–28 February 2023
Data processing and analysis	1 March – 1 May 2023
Drawing conclusions and mapping future research	1–31 May 2023

The questionnaire had a set of 13 questions, as follows:

- 2 questions for identifying the company (country, size),
- 1 filter question (have/have not purchased Romanian products for the purpose of selling),
- questions with multiple answers (Romanian products purchased in the past and future, the purchase motivations),
- questions with a single answer (purchase frequency, quantity, amount spend, etc.)
- questions with the 5-points Likert scale to assess satisfaction degree regarding the attributes of organic agri-food,
- 1 open question to ask for suggestions facilitating the visibility of Romanian organic food among foreign importers.

As no other results of similar research were identified in scientific literature, the research hypotheses were formulated empirically, starting only from statistical data and the international specialized reports cited in this paper, respectively (Table 2).

For data analysis the descriptive statistics were used (absolute and relative frequencies for categorical variables and means for variables measured on a 5 point-Likert scale). The following inferential statistical methods were applied:

- *Chi square test* was used to test two statistical hypotheses, if there are statistically significant differences depending on: (1) the company size regarding the quantity of the purchased Romanian organic agri-food products; and (2) the purchase motivations regarding the amounts invested by the companies from the three countries in purchasing Romanian organic agri-food products.

- *The Kruskal–Wallis for independent samples with Dunn’s Post hoc multiple comparisons* and the *Mann–Whitney tests* were applied to compare two or multiple groups of respondents, according to the country of origin, size of enterprise and whether Romanian organic products were purchased to test if there are statistically significant differences between scores for satisfaction attributes.
- *Pearson) and Kendall’s tau correlations* were applied to measure the directions and intensity of the association of variables.

Table 2. Research hypotheses and applied methods

Research hypothesis	Methods and tools applied
H1: At least 50% of the commercial/importing companies from the three countries have not purchased Romanian products	Descriptive statistics
H2: The most often purchased Romanian organic food products are unprocessed products	Descriptive statistics, chi square test
H3: The price is the most important motivation factor for purchasing Romanian organic agri-food products	Descriptive statistics, relationship maps, box-plots, correlations coefficients, Kruskal–Wallis test, Mann–Whitney test, regression model
H4: Romanian organic agri-food products need internationally recognized certifications to enter the European market	Descriptive statistics, Kruskal–Wallis test, Mann–Whitney test, regression model, qualitative analysis of the responses based on open question
H5: Romanian organic agri-food products are not promoted internationally	Qualitative analysis of the responses based on open question from questionnaires, relationship maps, regression model

To complete the analysis, the graphical representations of *relationship maps* and *box-plots* were used and the *regression models* to identify the best predictors for motivation to purchase Romanian organic products and for yearly amount invested in Romanian products. For the statistical analysis of the data collected, SPSS 29.0 (licensed) software was used, Microsoft Excel and GEODA were used for graphical representations.

4. Results and discussions

The filter question revealed that only 23.3% of the companies purchased Romanian organic agri-food products for further reselling them in their country of origin, Figure 5 present the categories of purchased products and their share in total purchases, respectively mainly cereals (21.67%), cereal-based products (20%) and medical herbs (13%) are purchased, while dairy products, meat or eggs are not purchased at all. Almost half of the investigated companies (45%) want to purchase Romanian organic agri-food products in the future (Figure 5).

The motivations for purchasing Romanian products have the following hierarchy: 29.5% – the affordable price, 23.5% – the products high quality and 16% each for recommendation of a specialist, trust in the Romanian organic agri-food products and being contacted by Romanian suppliers. A very large percentage (92.86%) of the companies purchased several times and 7.14% purchased once, these results highlighting the fact that the companies were satisfied with the Romanian products and thus engaged in a new purchasing process. The amount that would be invested: 40% – under 1000 Euros, 31.7% – over 10000 Euros, 21.7%

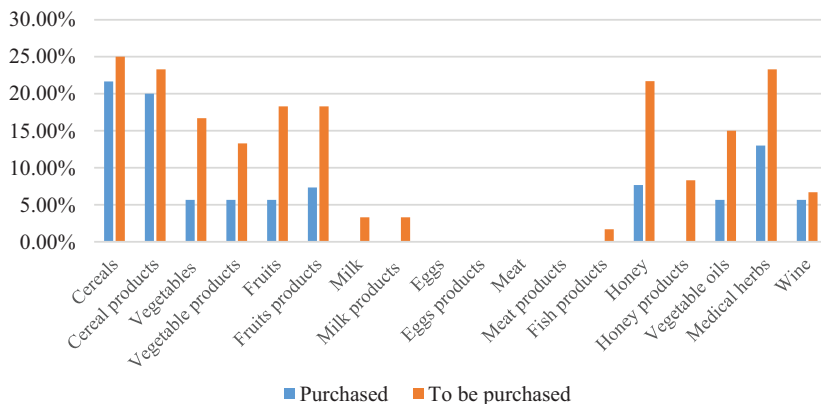


Figure 5. Types of organic agri-food products purchased and planned to be purchased by foreign firms

between 1000 and 3000 Euros and 6.7% between 3000 and 5000 Euros. In Figure 6a–d based on relationship maps it shows the links between: (a) purchased frequency, country and yearly amount, (b) purchased frequency, motivation to buy Romanian organic products and invested amount per year, (c) purchased frequency, enterprise size and yearly amount, (d) purchased frequency, yearly invested amount and overall satisfaction.

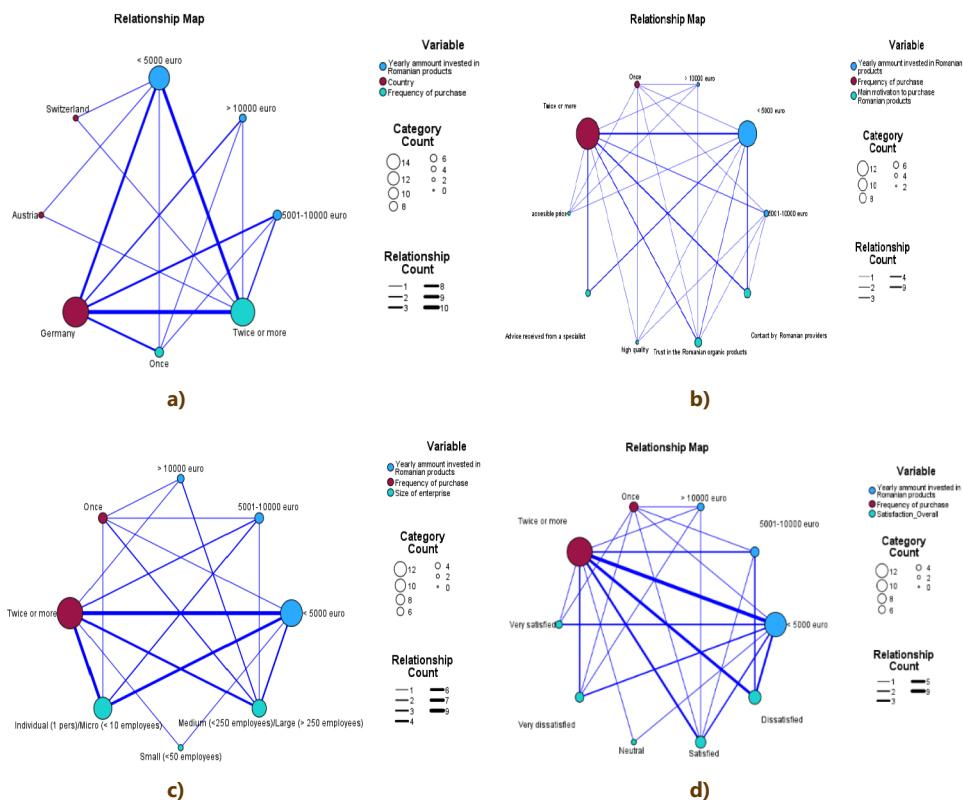


Figure 6. Relationships map between variables from the study

The distribution of answers referring to the satisfaction degree regarding the various attributes of the Romanian products is presented in Figure. 7a–g, the satisfaction level being measured with Likert scale. The average scores related to these attributes indicate that companies from Germany, Austria and Switzerland are satisfied with quality (3.93), price (3.92) and the relation with Romanian suppliers (3.63) and are neutral regarding issues related to bureaucracy (3.30) and distance (3.15), generally being satisfied with the Romanian organic agri-food (3.65).

Regarding the quantity of Romanian products, 48.5% of companies purchased over 5000 kg, 22.7% between 1001 and 5000 kg, 14.3% between 101 and 1000 kg and the same percentage of 14.3% quantities under 100 kg. Among the reasons causing the lack of interest in future acquisition of Romanian organic agri-food products are: 18.33% – lack of information, 11.67% – lack of trust in Romanian institutions, 11.67% – too long distance, 6.67% – too much bureaucracy, 6.67% – distrust in Romanian products.

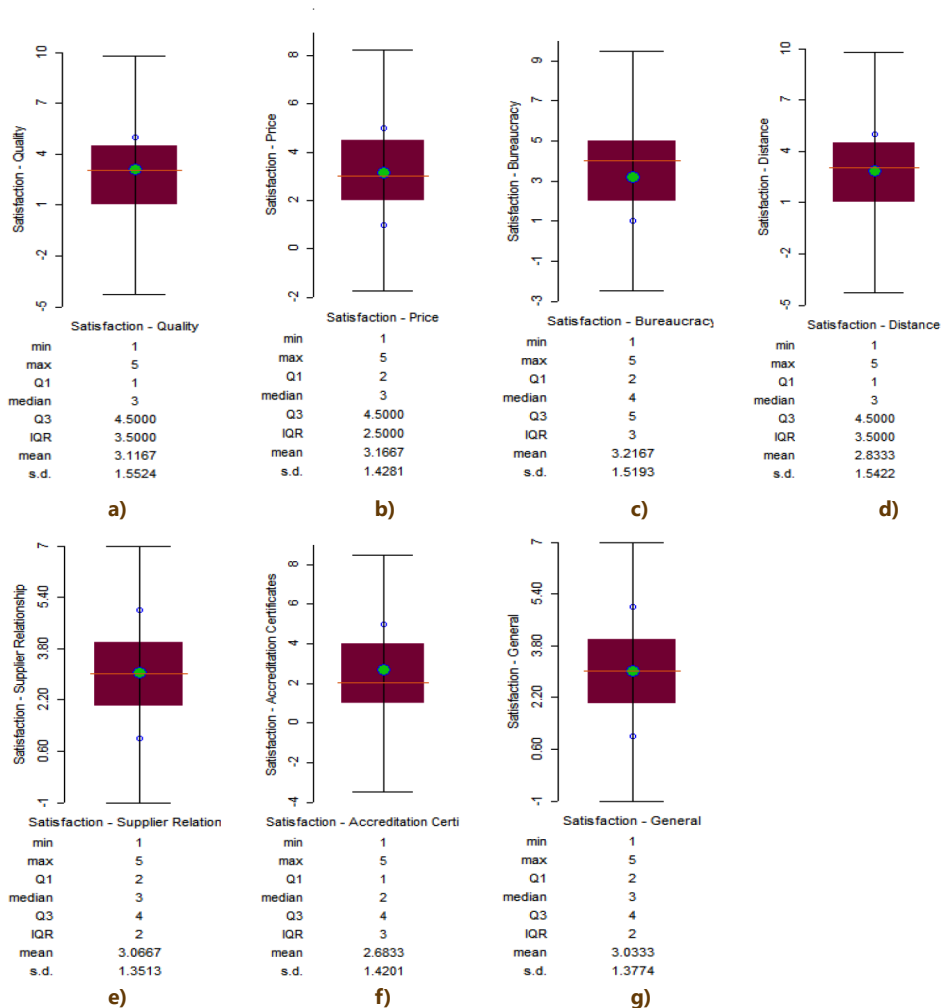


Figure 7. Box plots for satisfaction according to attributes (source: made by the authors)

The last question of the questionnaire, an open question, asking for suggestions regarding how Romanian products could gain visibility and interest among foreign importers, highlighted aspects such as:

1. transparency in trade between Romania and other countries, highlighting the importance establishing trustful relations;
2. product certifications are very important, while IMO and Bio Suisse certifications are recommended. Also, the reorientation of organic farmers towards Demeter certified agriculture would represent a much greater opportunity for small farmers, as Demeter certified products are highly demanded in developed countries such as Germany and their prices are much higher than other organic agri-food products;
3. orientation towards wholesalers is an option to which Romanian suppliers are urged, because the relations with wholesalers are long-lasting, as they constantly purchase organic products. Moreover, wholesalers buy large quantities of products. This can be seen as a benefit, but in countries such as Romania, wholesalers avoid purchases from small producers as they cannot cover market demand. A good way to solve this problem would be for small farmers to be organized in associations, through which they can more easily position themselves in the view of importers;
4. an aspect mentioned that opposes Romanian products import is, especially in Germany, consumers interest of consumers in regional products, from the origin country. However, by participating in various international fairs dedicated to organic agri-food suppliers, Romania could boost the demand for Romanian products by promoting its varied offer. Worth mentioning in this case is the importance of the "the story" behind the Romanian products as Europeans are sensitive to Romanian traditions, still preserved by small farmers;
5. avoiding bureaucratic obstacles is mentioned by some of the investigated companies. They consider that some aspects are useless and keep importers at distance, which is not desirable in the perception of small producers;
6. accessing reimbursable or non-reimbursable EU funds is a possibility to be taken into consideration by small farmers; financial support is very important given that most producers complain about high production, distribution, and promotion costs. Access to these funds can boost local businesses development so that they become well known at European and international level;
7. educating and informing the Romanian suppliers about all elements of the marketing mix is very important; the suggestions from foreign companies focused on informing about the types of crops best rated on the international market, the cultivation process, as well as the importance of crop rotation and the use of natural fertilizers.

For the application of the bivariate chi square test, the distributions shown graphically in Figures 8–9 were used, while the results are as follows, there are no statistically significant differences depending on: (1) the company size regarding the quantity of the purchased Romanian organic agri-food products (p -value = 0.2822); (2) the purchase motivations regarding the amounts invested by the companies from the three countries in purchasing Romanian organic agri-food products (p -value = 0.8702).

The *Kruskal–Wallis test* for independent sampling with *Dunn' Post Hoc Multiple Comparisons* and the *Mann–Whitney test* was applied to test if there are statistically significant differences according to the country, if they purchased or not Romanian products and the size of enterprises, results being presented in Table 3. All these null hypotheses, based on p -values > 0.05 from Table 3 are retain except for *Certification* of the Romanian products between those organizations which purchased or not (p -value < 0.05).

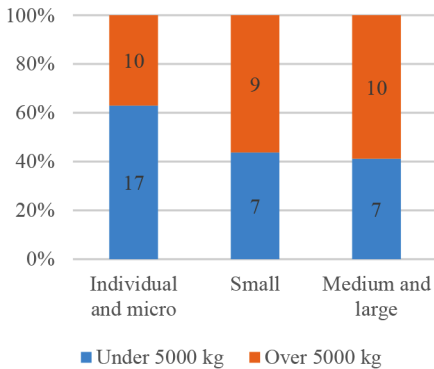


Figure 8. Distribution of quantity purchased from Romania according to company size

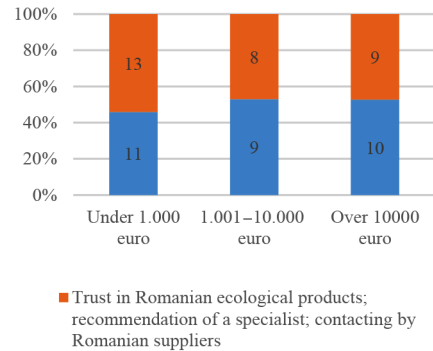


Figure 9. Distribution of motivation for purchasing from Romania according to amounts invested

Table 3. Results of Kruskal–Wallis and Mann–Whitney tests

	Null Hypothesis	Sig. ^{a,b} across categories of:		
		Country ¹	size of enterprise ¹	purchase/not ²
1	The distribution of Quality is the same	.460	.433	.557
2	The distribution of Price is the same	.231	.413	.600
3	The distribution of Bureaucracy is the same	.348	.628	.951
4	The distribution of Distance is the same	.989	.139	.668
5	The distribution of Relationship with providers is the same	.764	.848	.662
6	The distribution of Certification products is the same	.185	.400	.047
7	The distribution of Overall satisfaction is the same	.610	.415	.453

Notes: a – The significance level is .050; b – Asymptotic significance is displayed.

1. Kruskal–Wallis test; 2. Mann–Whitney test.

To find out which of to find out which direction and strength of the link between the Romanian product attributes measuring satisfaction (or whether they correlate) we applied Pearson correlation, the results are presented in Table 4. According to these results:

- there is a negative correlation, low to medium intensity (-0.339), statistically significant ($p\text{-value} < 0.05$) between *quality* and *distance*, those organizations which high scored the quality of Romanian products, disagreed with the distance between countries;
- there is a negative correlation, low intensity (-0.252), statistically significant ($p\text{-value} < 0.05$) between *relationship with providers* and *price*, those organizations which high scored the price of Romanian products, disagreed with the relationship with Romanian providers;
- there is a positive correlation, low intensity (-0.248), statistically significant ($p\text{-value} < 0.05$) between *overall satisfaction* and *certification of Romanian products*, those organizations which high scored the overall satisfaction for Romanian product appreciated also only if the products have certification.

Table 4. Pearson correlations

		Quality	Price	Bureau- cracy	Dis- tance	Relationship with providers	Certifi- cation	Over- all
Quality	Pearson Correlation							
	N	60						
Price	Pearson Correlation	.152						
	Sig. (2-tailed)	.247						
	N	60	60					
Bureau- cracy	Pearson Correlation	.003	-.118					
	Sig. (2-tailed)	.979	.367					
	N	60	60	60				
Distance	Pearson Correlation	-.339**	-.156	.139				
	Sig. (2-tailed)	.008	.233	.291				
	N	60	60	60	60			
Relation- ship with providers	Pearson Correlation	-.060	-.252*	-.172	.184			
	Sig. (2-tailed)	.647	.042	.188	.159			
	N	60	60	60	60	60		
Certifi- cation products	Pearson Correlation	-.183	-.124	.056	.123	.197		
	Sig. (2-tailed)	.162	.345	.671	.351	.132		
	N	60	60	60	60	60	60	
Overall	Pearson Correlation	-.152	.014	-.028	-.053	.135	.248*	
	Sig. (2-tailed)	.245	.913	.833	.686	.302	.046	
	N	60	60	60	60	60	60	60

Note: * – Correlation is significant at the 0.05 level (2-tailed).

The non-parametrical correlation was applied to find out if there are statistically significant correlations between variables from Table 5. The results indicate that:

- there is a positive correlation, powerful intensity (0.950), statistically significant (p-value < 0.05) between *frequency of purchase and main motivation to buy the Romanian products*, practically the intensity to buy Romanian products increasing with motivation from high quality of Romanian products to the specialist recommendation and to be contacted by a Romanian provider. The same pattern holds for purchased quantity (+0.910);
- there is a positive correlation, powerful intensity (0.950), statistically significant (p-value < 0.05) between *frequency of purchase and purchased quantity*, practically the intensity to buy Romanian products increasing with the quantity purchased and those organizations which purchase once Romanian products and/or a small quantity, either rebuy or increase the quantity.

Table 5. Kendall's tau correlations

			Main motivation to purchase Romanian products	Frequency of purchase	Purchased quantity	Yearly amount invested in Romanian products
Kendall's tau_b	Main motivation to purchase Romanian products	Correlation Coefficient				
		Sig. (2-tailed)	.			
		N	60			
	Frequency of purchase	Correlation Coefficient	.950**			
		Sig. (2-tailed)	<.001	.		
		N	60	60		
	Purchased quantity	Correlation Coefficient	.910**	.916**		
		Sig. (2-tailed)	<.001	<.001	.	
		N	60	60	60	
	Yearly amount invested in Romanian products	Correlation Coefficient	-.022	-.020	.015	
		Sig. (2-tailed)	.856	.871	.903	.
		N	60	60	60	60

Based on these results from correlations and statistical inference, we applied two regression models:

1. Model 1 (multilinear) with *motivation to purchase Romanian products* as dependent variable and as independent variables: size of enterprise, overall satisfaction, quantity purchased, yearly amount invested and all the satisfactions attributes from Table 4, with R^2 coefficient = 0.663 (independent variables explain 66.3% of variance of dependent variable, motivation to buy Romanian products) and p-value from ANOVA < 0.001. The results are presented in Table 6 and Figures 10–11.
2. Model 2 (univariate) with *yearly amount invested in Romanian products* as dependent variable and as independent variable, each satisfaction attributes from Table 4. These results are presented in Figures 12–13.

Table 6. Regression coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.509	.979		1.542	.129
	Size of enterprise	-.246	.163	-.135	-1.513	.137
	Overall satisfaction	-.060	.103	-.051	-.582	.563
	<i>Purchased quantity</i>	1.719	.196	.758	8.774	<.001

End of Table 6

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Yearly amount invested in Romanian products	-.274	.199	-.124	-1.376	.175
Quality	.004	.097	.004	.038	.970
Price	-.112	.101	-.100	-1.115	.270
Bureaucracy	.061	.097	.058	.633	.530
Distance	-.020	.099	-.019	-.205	.839
Relationship with providers	.099	.111	.084	.895	.375
Certification products	-.127	.105	-.112	-1.211	.075

Note: a – Dependent variable: Main motivation to purchase Romanian products.

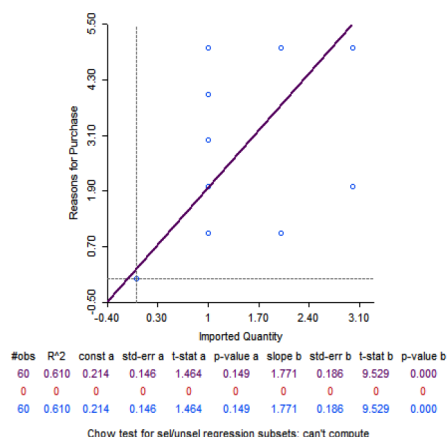


Figure 10. Reason for purchase according to imported quantity

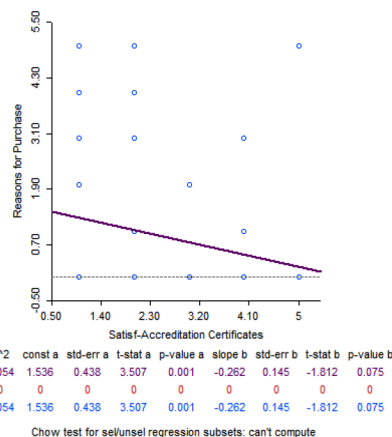


Figure 11. Reason for purchase according to accreditation certificates

According to the above-mentioned results for Model 1, the best predictors for motivation of Germany, Switzerland and Austria to buy Romanian products are the purchased quantity and the certification of the Romanian products as follows: as increasing with 1 unit of purchased quantity (from less than 1000 kg to over 5000 kg) the motivation increased with 1.719 units from products quality to specialists recommendation and to be contacted by Romanian providers. Also, a one-unit increase in the score for Certification of Romanian products, the motivation decreases with 0.127 units from "to be contacted by Romanian providers" to the quality of the Romanian organic products. All these details are presented in Figures 10–11.

For the second regression model, Model 2, the best predictors for yearly amount invested by Germany, Switzerland and Austria into Romanian products are *bureaucracy* and the *relationship with the supplier* but both satisfaction attributes explain less than 10% of variance of invested amount even the regression models are statistically significant (Figures 12–13).

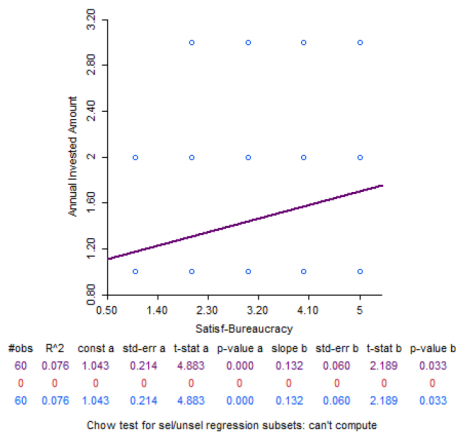


Figure 12. Annual invested amount according to satisfaction - bureaucracy

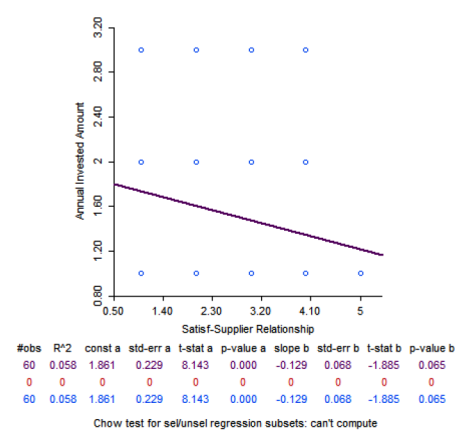


Figure 13. Annual invested amount according to satisfaction – supplier relationship

5. Conclusions

The global organic food retail market in general and the European one in particular is one of the most dynamic in recent years, with Europe having the largest market share through countries such as Denmark (12.1%) and Austria (9.3%) according to FIBL reports and global sales of approximately 45 billion Euro in 2019, of which 41.4 billion Euro in Europe. The highest sales value is in Germany, of 11.97 billion Euro according to the FIBL Report of 2021. European consumers also spend, according to FIBL' recent reports, the largest sums of money on organic products and Europe are the largest importer for this kind of products, including from China.

The present research results, together with those of international reports and statistics demonstrating the fragmentation of agricultural land and the small size of Romanian farms, indicate that Romania, although it has potential and the necessary infrastructure, is not fully prepared for the production and distribution of agri-food in Europe. This is also proved by the modest figures on their presence on the European market, despite the positive dynamics of recent years. Therefore, the purpose of this research to measure directly at the beneficiary the opinions and perceptions of retailers from three European countries in the top of organic products market regarding Romanian products is opportune and welcomed, with direct implications at micro and macro level.

The objectives of the present research have been achieved, providing information about: the preferences of Austrian, German and Swiss retailers in terms of organic agri-food products; the purchased quantities; factors influencing the purchasing decision; the purchase frequency; the degree of satisfaction regarding the most important aspects; the amount they want to invest in Romanian products; suggestions offered regarding Romanian products becoming easier in the attention of European importers and regarding a better relation with the business environment of the three countries and not only.

According to the research results some of the research hypotheses were validated, some not. Thus, the *H1* was not validated because a very high percentage, 92.8% of the companies in the study were not at their first purchase of Romanian organic products. The *H2* was not

validated, as retailers in Austria, Germany and Switzerland also purchased other product categories, processed products (e.g. wine, oil, etc.). The *H3* was validated with the mention that the other criteria in the study are very close to price: high quality of the products, the trust in the Romanian products. This supports previous findings who identified cost efficiency as a primary determinant in sustainable agri-food supply chains.

The *H4* = is validated and this is one of the main suggestions and recommendations made by investigated companies to ensure the European success of the Romanian products. This finding is consistent with previous researchers, who argued that certification systems play a decisive role in strengthening the competitiveness of organic producers within the EU.

The *H5* was also validated, as the main reason for not purchasing Romanian products is the lack of information about them on the European market.

The results of this research should be interpreted considering some of its *limitations*: (1) the lack of interest/response of the companies from the three European countries regarding the topic/subject, the response rate was 3.43%; (2) the impossibility, reported in time, to contact all the retailers of organic products, in European countries; (3) invalid e-mail addresses of some companies; (4) the absence of e-mail addresses or contact details on the websites of Austrian, Germany and Swiss companies; (5) limits associated with communication in the native language of foreign companies, when they were unable to communicate in a foreign language of international circulation; (6) limits deriving from the questionnaire complexity, as it is not possible to extend it due to the lack of time invoked by some of the respondents; (7) limits due to the impossibility of some companies to disclose information they consider confidential.

The analysis of past/outdated data continues to hold significant value by facilitating the extraction of important lessons and insights pertinent to the field. Such data functions as a fundamental reference point, enabling researchers to systematically evaluate and interpret long-term temporal trends and the progression of patterns over specified periods. Moreover, in a comparative approach with more recent or current data of further research, it provides a comprehensive framework for understanding the evolution of key variables. This lays the groundwork for subsequent research endeavors aimed at further investigating dynamic changes over extended timeframes.

As future research: (1) we will take into consideration other important variables for organic producers from Europe as founding accessing dedicated for development of organic agri-food, presence in social media for promoting their organic agri-food products, circular economy indicators; (2) to enlarge the suppliers sample to Eastern European group of countries (not only for Romania) to the Western European countries as retailer resellers and (3) Romanian suppliers to other West European countries in the top of organic consumer such as Italy, France.

In this European market context dominated by countries such as Germany and Austria and complemented by the positive dynamics in recent years of Romania's organic agriculture indicators, this study offers concrete answers to punctual questions regarding the supplier-retailer relation in organic agri-food supply chain, relevant in the context of FFS and EUGD. While other research explored the macroeconomic implications of the EUGD, our research highlights the practical challenges faced by suppliers in Romania who are attempting to align with these sustainability targets.

The research contributes to some directions for strengthening the green agriculture and food sector in Romania, with implications that may also apply to other Eastern European countries with similarities. Furthermore, the current challenge lies in transitioning from policy

development to successful implementation therefore the research could be a valuable reference point for policy makers, practitioners and all stakeholders involved. Further validation of using larger and more diversified samples across the EU is recommended to generalize these findings and strengthen cross-border policy recommendations.

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Author contributions

All authors have contributed equally.

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